

CLAIMS

*Sub A17*

1. A subscriber telephone system comprising:  
a first driver circuit coupled to a tip terminal;  
a second driver circuit coupled to a ring terminal;  
a network coupled between the second driver circuit and the ring terminal, the network including a capacitor and a diode limiter coupled in parallel between an output of the second driver circuit and the ring terminal, and structured to minimize the overall ring voltage while maintaining a desired battery mean value.
- 10 2. The subscriber telephone system according to claim 1, wherein said diode limiter comprises a MOS transistor.
- 15 3. The subscriber telephone system according to claim 1, further comprising an external filter coupled to the tip and ring terminals and structured to extract a sinusoidal ringer signal.
- 20 4. A subscriber telephone circuit including a voltage shifting network coupled between an output driver and a ring terminal, the voltage shifting network comprising:  
a diode having a first terminal coupled to the output driver and a second terminal coupled to the ring terminal; and  
a capacitor having a first terminal coupled to the output driver and a second terminal coupled to the ring terminal.
- 25 5. The subscriber telephone circuit of claim 4 further comprising:  
a resistance coupled between the second terminal of the diode and a supplied voltage.
6. The subscriber telephone circuit of claim 5 wherein the supplied voltage is a negative voltage.

7. The subscriber telephone circuit of claim 5 further comprising a second diode coupled between the supplied voltage and the resistance.

8. The subscriber telephone circuit of claim 4 wherein the diode is formed by an MOS transistor.

5 9. The subscriber telephone circuit of claim 8 wherein the MOS transistor has a gate electrode coupled to a switch controller.

10 10. The subscriber telephone circuit of claim 8 wherein the MOS transistor is PMOS.

10 11. A subscriber telephone circuit including a voltage shifting network, the subscriber telephone circuit comprising:

- 15 a first SLIC driver coupled to a ring terminal;
- a second SLIC driver coupled to a tip terminal;
- a first ringing driver coupled to a first inductive-capacitive network and to the ring terminal; and
- a second ringing driver coupled to a second inductive-capacitive network and to the tip terminal.

15 12. The subscriber telephone circuit of claim 11 wherein the first ringing driver is coupled through a first inductor to the ring terminal.

20 13. The subscriber telephone circuit of claim 12 wherein the ring terminal is coupled through a capacitor to a ground reference voltage.

25 14. The subscriber telephone circuit of claim 11 wherein the first ringing driver and the second ringing driver are structured to only be active during a ringing function, and are controlled by a level driver interface that is structured to receive a driving signal.

15 The subscriber telephone circuit of claim 14 wherein the driving signal is a pulse width modulation signal.

16. A method of minimizing an overall voltage during a ringing function of a subscriber telephone circuit provided with a mean battery voltage, the method 5 comprising:

applying a tip ringing signal to a tip terminal;  
applying a ring ringing signal to a first terminal of a network;  
attenuating the ring ringing signal through a capacitive network; and  
applying the attenuated ring ringing signal to a ring terminal.

10 17. The method of claim 16 further comprising;

coupling the attenuated ring ringing signal through a resistive network to a negative battery voltage.

15 18. The method of claim 16 wherein attenuating the ring ringing signal through a capacitive network comprises modifying the ring ringing signal through an inductive-capacitive network.

*add 17*